

REMARKS:

Claims 1-22 were originally filed in the patent application.

Claims 1-6 and Claims 12-17 have been elected in response to a restriction requirement.

Claims 7-11 and Claims 18-22 have been withdrawn with traverse.

Claims 1-6 have been rejected.

Claims 1-6 and Claims 12-17 remain in the patent application.

Reconsideration of Claims 1-6 and Claims 12-17 is respectfully requested.

AMENDMENTS TO THE SPECIFICATION

The Applicant has amended the specification to correct typographical errors. On Page 5, the word “and” was deleted from Paragraph [0011]. On Page 17, some reference numerals were corrected in Paragraph [0050] and in Paragraph [0051]. Because the correct reference numerals (and a reference to restraining edge 425) are shown in FIGURE 7, no new material has been added to the specification by this amendment. Please amend the specification to enter the corrections.

ACKNOWLEDGMENT OF ELECTION OF GROUP I CLAIMS

On Page 2 of the July 13, 2004 Office Action, the Examiner acknowledged the Applicant's election with traverse of the Group I claims. (July 13, 2004 Office Action, Page 2, Lines 3-4). The Examiner then stated that "Claims 7-22 are withdrawn from further consideration pursuant to 37 CFR 1.142(b), as being drawn to a nonelected invention . . ." (July 13, 2004 Office Action, Page 2, Lines 5-6). The Applicant respectfully submits that Claims 12-17 have not been withdrawn because Claims 12-17 are part of the Group I claims. (March 10, 2004 Restriction Requirement, Page 2, Lines 4-5). Therefore, Claims 1-6 and Claims 12-17 remain in the patent application.

CLAIM REJECTIONS – 35 U.S.C. § 102

On Page 2 of the July 13, 2004 Office Action, the Examiner rejected Claims 1-6 under 35 U.S.C. § 102(e) as being anticipated by United States Patent Number 6,478,212 issued on November 12, 2002 to *Engel et al.* (hereafter referred to as "*Engel*"). The Applicant respectfully traverses the rejection of Claims 1-6 for the reasons set forth below.

It is axiomatic that a prior art reference anticipates the claimed invention under 35 U.S.C. § 102 only if every element of a claimed invention is identically shown in that single reference, arranged as they are in the claims. MPEP § 2131; *See, In re King*, 231 USPQ 136, 138 (Fed. Cir. 1986) (citing with approval, *Lindemann Maschinenfabrik v. American Hoist and Derrick*, 221 USPQ 481, 485 (Fed. Cir. 1984)); *In re Bond*, 910 F.2d 831, 832, 15 USPQ2d 1566, 1567

(Fed. Cir. 1990). Anticipation is only shown where each and every limitation of the claimed invention is found in a single prior art reference. MPEP § 2131; *In re Donohue*, 766 F.2d 531, 534, 226 USPQ 619, 621 (Fed. Cir. 1985).

With respect to any of Claims 1-6, a determination of anticipation in accordance with Section 102 requires that each feature claimed therein be described in sufficient detail in *Engel* to enable one of ordinary skill in the art to make and practice the claimed invention.

The Applicant respectfully disagrees with the Examiner's assertions regarding the subject matter disclosed in the *Engel* reference. The Applicant respectfully submits that the *Engel* reference does not show each and every limitation of the Applicant's invention. The Applicant directs the Examiner's attention to Claim 1, which contains unique and novel limitations:

1. (Original) A method for fabricating a structure for receiving a wire bond, said method comprising the steps of:
fabricating a substrate material having portions that form a substrate cavity within said substrate material;
filling said substrate cavity with portions of a wire bond pad to form a wire bond cavity in said wire bond pad; and
covering edge portions of said wire bond pad with passivation material.
(Emphasis added).

Claim 1 is directed to a method for increasing the strength of a bond made by a small diameter wire in ball bonding. This is accomplished by increasing the strength of the coupling of the wire bond pad to an underlying substrate. This involves the formation of a substrate cavity within the substrate material. The method disclosed by *Engel* does not have this feature.

The Examiner stated “In regards to claim 1, Engel teaches a method for fabricating a structure for receiving a wire bond, said method comprising the steps of: fabricating a substrate material having portions that form a substrate cavity within said substrate material; filling said substrate cavity with portions of a wire bond pad to form a wire bond cavity in said wire bond pad; and covering edge portions of said wire bond pad with passivation material at column 5, lines 18-25.” (July 13, 2004 Office Action, Page 2, Line 22 to Page 3, Line 2).

The Applicant respectfully traverses this assertion of the Examiner. The cited portion of Engel states: “ 1. A bond pad structure for an integrated circuit, said bond pad structure comprising: a cavity formed within said base member, said cavity configured to capture said wire therein; said cavity further comprising a first open end having a first width and a second open end having a second width, wherein said first width is greater than said second width; and” (*Engel*, Column 5, Lines 18-25). There is no reference to a cavity within an underlying substrate material.

The specification of *Engel* states that “FIG. 1 illustrates an embodiment of a bond pad structure 10 having a base member 12 formed upon a substrate 14 of integrated circuit 16. (*Engel*, Column 2, Lines 32-34) (Emphasis added). The *Engel* reference discloses a bond pad structure but, unlike the Applicant’s invention, does not disclose how a bond pad structure may be coupled to an underlying substrate material to increase the bond strength between the bond pad structure and the substrate material. Therefore, the method and structure of the Applicant’s invention as set forth in Claim 1 is not anticipated by the *Engel* reference.

Claim 2 and Claim 3 are dependent upon Claim 1 and contain the claim limitations of Claim 1. For this reason Claim 2 and Claim 3 also contain the claim limitation of “fabricating a substrate material having portions that form a substrate cavity within said substrate material.” Therefore, Claim 2 and Claim 3 are also not anticipated by the *Engel* reference.

The Applicant also respectfully submits that the *Engel* reference does not show each and every limitation of the Applicant’s invention in Claim 4. The Applicant directs the Examiner’s attention to Claim 4, which contains unique and novel limitations:

4. (Original) A method of wirebonding a wire to a structure for receiving a wire bond, said method comprising the steps of:

fabricating a substrate material having portions that form a substrate cavity within said substrate material;

filling said substrate cavity with portions of a wire bond pad to form a wire bond cavity in said wire bond pad;

covering edge portions of said wire bond pad with passivation material; and
wirebonding a ball on an end of said wire to said wire bond cavity.

(Emphasis added).

Claim 4 is directed to a method of wirebonding having an increased strength of a bond made by a small diameter wire in ball bonding. This is accomplished by increasing the strength of the coupling of the wire bond pad to an underlying substrate. This involves the formation of a substrate cavity within the substrate material. The method disclosed by *Engel* does not have this feature.

The Examiner stated “In regards to claim 4, Engel teaches a method of wirebonding a wire to a structure for receiving a wire bond, said method comprising the steps of: fabricating substrate

material having portions that form substrate cavity within said substrate material; filling said substrate cavity with portions of a wire bond pad to form a wire bond cavity in said wire bond pad; covering edge portions of said wire bond pad with passivation material; and wirebonding a ball on an end of said wire to said wire bond cavity at column 4, lines 46-58.” (July 13, 2004 Office Action, Page 3, Lines 10-16).

For the reasons given above the Applicant also respectfully traverses this assertion of the Examiner. The *Engel* reference does not disclose how a bond pad structure may be coupled to an underlying substrate material to increase the bond strength between the bond pad structure and the substrate material. The *Engel* reference does not disclose forming a substrate cavity within the substrate material. Therefore, the method and structure of the Applicant’s invention as set forth in Claim 4 is not anticipated by the *Engel* reference.

Claim 5 and Claim 6 are dependent upon Claim 4 and contain the claim limitations of Claim 4. For this reason Claim 5 and Claim 6 also contain the claim limitation of “fabricating a substrate material having portions that form a substrate cavity within said substrate material.” Therefore, Claim 5 and Claim 6 are also not anticipated by the *Engel* reference.

The Applicant also respectfully submits that the *Engel* reference does not show each and every limitation of the Applicant’s invention in Claim 12. The Applicant directs the Examiner’s attention to Claim 12, which contains unique and novel limitations:

12. (Original) A method for fabricating a structure for receiving a wire bond, said method comprising the steps of:

fabricating a substrate material having portions that form a substrate cavity within said substrate material and that form a restraining edge of substrate material around said substrate cavity;

filling said substrate cavity with portions of a wire bond pad to form a wire bond cavity in said wire bond pad, wherein said wire bond pad has portions that form a restraining edge around said wire bond cavity; and

covering edge portions of said wire bond pad with passivation material.
(Emphasis added).

Claim 12 is directed to a method for increasing the strength of a bond made by a small diameter wire in ball bonding. This is accomplished by increasing the strength of the coupling of the wire bond pad to an underlying substrate. This involves the formation of a substrate cavity within the substrate material having a restraining edge of substrate material around the substrate cavity. The method disclosed by *Engel* does not have this feature.

Claim 13 and Claim 14 are dependent upon Claim 12 and contain the claim limitations of Claim 12. For this reason Claim 13 and Claim 14 also contain the claim limitation of “fabricating a substrate material having portions that form a substrate cavity within said substrate material and that form a restraining edge of substrate material around said substrate cavity.” Therefore, Claim 13 and Claim 14 are also not anticipated by the *Engel* reference.

The Applicant also respectfully submits that the *Engel* reference does not show each and every limitation of the Applicant’s invention in Claim 15. The Applicant directs the Examiner’s attention to Claim 15, which contains unique and novel limitations:

15. (Original) A method of wirebonding a wire to a structure for receiving a wire bond, said method comprising the steps of:

fabricating a substrate material having portions that form a substrate cavity within said substrate material and that form a restraining edge of substrate material around said substrate cavity;

filling said substrate cavity with portions of a wire bond pad to form a wire bond cavity in said wire bond pad, wherein said wire bond pad has portions that form a restraining edge around said wire bond cavity;

covering edge portions of said wire bond pad with passivation material; and
wirebonding a ball on an end of said wire to said wire bond cavity, wherein portions of said ball that fill said wire bond cavity under said restraining edge around said wire bond cavity form a restraining wedge.

(Emphasis added).

Claim 15 is directed to a method of wirebonding having an increased strength of a bond made by a small diameter wire in ball bonding. This is accomplished by increasing the strength of the coupling of the wire bond pad to an underlying substrate. This involves the formation of a substrate cavity within the substrate material having a restraining edge of substrate material around the substrate cavity. The method disclosed by *Engel* does not have this feature.

Claim 16 and Claim 17 are dependent upon Claim 15 and contain the claim limitations of Claim 15. For this reason Claim 16 and Claim 17 also contain the claim limitation of "fabricating a substrate material having portions that form a substrate cavity within said substrate material and that form a restraining edge of substrate material around said substrate cavity." Therefore, Claim 16 and Claim 17 are also not anticipated by the *Engel* reference.

ATTORNEY DOCKET NO. 02-C-088 (STMI01-00088)
U.S. SERIAL NO. 10/611,578
PATENT

For the reasons set forth above, the Applicant respectfully submits that Claims 1-6 and Claims 12-17 are in condition for allowance. The Applicant respectfully requests the Examiner to allow pass Claims 1-6 and Claims 12-17 to allowance.

The Applicant respectfully denies any position or averment of the Examiner that is not specifically addressed by the foregoing argument and response.

ATTORNEY DOCKET NO. 02-C-088 (STMI01-00088)
U.S. SERIAL NO. 10/611,578
PATENT

SUMMARY

If any issue arises, or if the Examiner has any suggestions for expediting allowance of this application, the Applicant respectfully invites the Examiner to contact the undersigned at the telephone number indicated below or at wmunck@davismunck.com.

The Commissioner is hereby authorized to charge any additional fees connected with this communication or credit any overpayment to Deposit Account No. 50-0208.

Respectfully submitted,

DAVIS MUNCK, P.C.

Date: Oct. 13, 2004



William A. Munck
Registration No. 39,308

P.O. Box 802432
Dallas, Texas 75380
Phone: (972) 628-3600
Fax: (972) 628-3616
E-mail: wmunck@davismunck.com